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No. 243

A E R O N A U T I C A L R E C O R D

No. 1 (To June, 1923).

Translation of "Chronique Aeronautique",
published by
the "Société d'Etudes et d'Informations Economiques,"

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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

TECHNICAL MEMORANDUM NO. 243

A E R O N A U T I C A L R E C O R D *

No. 1 (To June, 1923).

The importance assumed by aeronautics in the industrial and commercial field, the certainty inspired by statistics that regular transportation by airplane is making constant and rapid progress, that such service is gradually becoming a normal, economic reality and that, within the near future, it will play a preponderating part in the economic and political life of the nations; all these considerations have prompted us to pay special attention to the development of aeronautical industries and aerial navigation as a commercial enterprise and to publish an analytical review of events in the aeronautical world and of the attendant problems.

This "Record" will deal mainly with French enterprises and the aeronautical policy of the French Government, but opportunity will not be lacking to call attention, by way of comparison, to the efforts made and results obtained in foreign countries.

I. The Aeronautical Budget.

The French Budget. - In France, aeronautics figures on the budget of five governmental departments, namely: Navy, Colonial, * Translation of "Chronique Aéronautique," published by the "Société d'Etudes et d'Informations Economiques," 282 Boulevard Saint Germain, Paris, France.

Under-Secretariat of Civil Aviation, and Post Office.

In 1922, military aeronautics received about 250 million francs. For 1923, about 377 millions were granted. The Finance Committee of the Senate first proposed rather important reductions in the amount voted by the Chamber. In chapter 0.54 especially, dealing with Materiel, the appropriation was reduced from 180 to 160 millions. During the session, however, M. de Lubersac succeeded in having almost all the items placed on the desired basis. This he did by showing the dangers of "bargain-counter aviation." He said: "Economics of this kind are too dear. They are paid for in accidents and the lives of pilots."

Another large increase was proposed by the government while the bill was passing through Parliament a second time and was voted without difficulty.

Naval Aeronautics received an appropriation of 37 millions in 1922 and 105½ millions in 1923. The history of these appropriations is quite as surprising as in the former case. At first, the Chamber did not seem at all inclined to give naval aeronautics more than was strictly necessary for its maintenance, saying that it would be better to let the appropriation wait until the bill for reorganization of the Navy came up for discussion. The Finance Committee of the Senate was of the same opinion. However, the government again intervened and the "provisional appropriation" was largely increased with as little difficulty as in the previous case.

It is also worthy of remark that the Minister of War and the Minister of the Navy were authorized by law to enter into contracts in the second half of 1923, for aircraft to be delivered in 1924, and to be paid from the 1924 appropriations, aggregating not more than 50 millions for the Army and 13 millions for the Navy.

The Civil Air Service has not been so lucky with its budget as the two military services. In 1922 the appropriation was 147 millions, $41\frac{1}{2}$ of which were for bonuses and subsidies for air lines. For 1923, only $138\frac{1}{2}$ millions were allotted, the amount allotted for bonuses and subsidies remaining the same as before. A very lively discussion on this budget took place in the Chamber, particularly on that part relating to bonuses. It was thought that the government should have kept better control over the subsidized air lines. The report of the Finance Committee, based upon theory and on inaccurate calculations, was severely commented upon and the Under-Secretary of State for Aeronautics, M. Laurent-Eynac, was urged to draw up a clearly defined and comprehensive program for the air lines and to follow it strictly. He was again urged to grant the air lines a more firmly settled basis. After all this, however, the appropriation remained as voted by the Chamber on the first reading and much below the amount asked by the government. For bonuses and subsidies alone, the government requested $49\frac{1}{2}$ millions.

In the Colonial Budget, 5 millions were granted for Army aeronautics in French Africa and Indo-China.

Foreign Budgets. - Generally speaking, it is difficult to compare the French budget with those of other countries, because, in France, the fiscal year ends December 31, thus coinciding with the calendar year, while in most of the other countries the fiscal year does not so coincide and therefore includes portions of two calendar years. It is especially difficult to compare the aeronautical budget of any two countries, since aeronautics is developing with such rapidity. The difficulty of comparison is still further increased by the fact that, both in France and elsewhere, budgets are only voted after considerable delay. For all these reasons it is extremely difficult to make a strictly accurate comparison. The following figures will therefore give only an approximate indication of the financial efforts made by different countries and in some cases the figures quoted are already rather out of date.

Great Britain. - The amount voted for the Air Force for the fiscal year 1923-1924 (beginning July 1, 1923) is 18,500,000, pounds, a very appreciable increase over the previous year's budget. From the statements made by the Air Secretary, Sir Samuel Hoare, and also by the Marquis of Salisbury, it would appear that, before very long, Parliament will be asked for still larger appropriations, which will doubtless be granted.

United States. - For the fiscal year 1923-1924, a total sum of \$29,300,000 was first asked for. This sum is practically the same as for the previous year and included about 13 millions for

the Army Air Service, nearly 15 millions for the Navy Air Service, and nearly 2 millions for the Air Mail Service. Later information, however, warrants us in saying that much greater appropriations will be requested (25 million dollars for the Army Air Service alone).

Germany. - The German Government has made enormous appropriations (astronomical figures, as we say now,) to keep up air lines and to aid aviation constructors to continue their work, in spite of the restrictions imposed by the Allies. But the fluctuations in the purchasing power of the mark make it impossible to quote definite figures and especially, to express their value in francs. Any comparison is therefore impossible.

Russia. is said to have an air budget of 36 million gold rubles.

Italy. - For 1923, M. Mussolini's air budget amounts to the large sum of 280 million lire, with which he hopes to reorganize aviation in Italy.

Czecho-Slovakia. - The air budget of 1923 amounts to 150 million crowns, of which 146 millions go to military aeronautics. We are informed that there are also "additional appropriations," amounting to 38 million crowns, for the construction of new aircraft for the Army. The present budget exceeds the previous one by 23 million crowns.

Switzerland. - - For 1923 the air budget amounts to a million and a half francs. For 1922, it was slightly over a million.

Spain. - At present we only know the figures for the fiscal

year 1922-1923. The Army Air Service has received $36\frac{1}{2}$ million pesetas, against only $5\frac{1}{2}$ last year. The Naval Air Service has no appropriation of its own, nor has civil aviation, but the former will probably receive a portion of the Naval appropriation, while civil aviation will come in for a portion of the 40 million pesetas granted to the Public Works Department, for maritime and aerial communications.

Japan. - 32 million yen for the Naval Air Service and 10 million yen for the Army Air Service was appropriated for the fiscal year 1922-1923 (ending March 1).

Although, as we have said, it is almost impossible to compare these figures, at least one interesting fact is to be noted in all the budgets, namely, the constantly increasing amounts allotted to aeronautics, and particularly to military aeronautics. If economies are made in other Army expenses, the Army Air Service derives the benefit. In England, we hear of the "One Power Standard." England wishes to make its Army Air Service at least equal to the strongest possessed by any other country (that is, equal to the French Air Service).

Should we regret this and get anxious about it? Perhaps. From an economic point of view, it may at least be said that it is an exceedingly interesting situation. In the Army, as in commerce, a new economic power is being set up.

II. Organization of the Air Service.

Aeronautics is just now in the throes of a perilous crisis in which some of its component parts run the risk of being seriously compromised. This crisis is due to many causes, but the one most frequently brought forward, (and which is doubtless important), is the lack of agreement between the five governmental departments among which the air Service is divided.

The "Bulletin" of April 23, in discussing the press campaign on this subject, mentioned a typical example of the lack of mutual agreement cited in the Chamber by Captain Fonck: Near Strasburg there is a military aviation field which has hitherto been used also for commercial aviation purposes. Without any valid reason, it has been planned to fit up another field for commercial aviation a long distance away. Then, while the Army aviation field will be only two kilometers from the city, the commercial aviation field, which should be as near as possible, will be twenty kilometers away.

The Air Ministry. - Will this fatal "every man for himself" policy disappear only when all branches of the air service are united under the direction of an all-powerful Air Ministry, whose authority will extend over every branch of the air service: military, naval, civil, postal and colonial? Many members of Parliament have asserted this during the discussion of the budget. Some air authorities have said the same thing and we are inclined to believe it. We must admit, however, that the question is not so simple as it seems, nor so easily solved.

The "Air Ministry" is only a phrase and we must beware of being deceived by the magic of the mere words. There is no doubt whatever that unity is lacking in our air services and that this is prejudicial to aeronautics as a whole, but it is by no means certain that the remedy proposed is the only possible remedy nor that it could be applied without danger in the present state of affairs.

If the Army Air Service should be made independent of the War Department, would it not create a separation between the Air Service and the other arms even more fatal than the separation under which we are now suffering, even though the Air, War and Navy Departments should all be placed under the supreme authority of the Department of National Defense, whose business it would be to impose uniform regulations and reconcile their demands. In any event, the question is worthy of serious study.

In France, members of Parliament are not lacking, who would be willing to try the experiment of an Air Ministry for their own benefit and that is just why we hesitate, why we distrust their arguments. There is too much personal interest in the matter.

In Italy, the experiment is being tried and we may learn something from it. On the 24th of last January, M. Mussolini instituted, by decree, a High Commission of Aviation and made himself High Commissioner with dictatorial powers. He may "deviate from legal regulations in force." One can hardly imagine a ministry with greater powers and freedom. Under it are organized

two general services: the Army Air Service and the Civil Air Service. When we know the tangible results of this reorganization, we can decide what to do in France.

Until then, may we not obtain satisfactory results with our present organization, by making a few changes in the personnel, perhaps. It seems to me to be only a matter of good will and method.

The Under-Secretariat of State for Aeronautics has already some authority over the whole of the Air Service, since, as M. Laurent-Eynac, the present incumbent, remarked with some satisfaction in the Senate, it is "not only the sole source of supplies, but also the only experimenter for the War, Navy and Colonial Ministries." It is already in charge of the departments of technical research, industrial policy and aerial navigation, to mention only the most important of its functions. If, in these departments, simple and definite programs were formulated and followed up with method and perseverance and brought, by persuasion, into force in the other branches of the Air Service, the "Air Ministry" would perhaps already have an actual existence. At least, a solid foundation would be laid, on which a future Air Ministry could be constructed.

Aviation, an Autonomous Arm. - Before closing this chapter, we may mention two interesting attempts at organization. One, which was brought about at the end of last year, is the constitution of the Army Air Service as an independent body. This measure is certainly useful, but not without danger. It will

prevent pilots from being promoted otherwise than in the ranks of the Air Service and will thus hinder the constant rejuvenation of the flying personnel, which is a necessity.

Bill for the Organization of Naval Aeronautics. - The other attempt at organization is the bill recently presented to Parliament by the government. This bill provides for the complete reorganization of the Naval Air Station. On a peace footing, this service would comprise 50 aviation squadrons and some balloon units.

III. The Aviation Industry.

The Industrial Crisis. - The aviation industry has suffered a good deal from the above-mentioned crisis, particularly since 1921. M. Pierre Etienne Flandin, formerly Under-Secretary of State for Aeronautics, gave a clear example of this state of affairs in a speech delivered in the Chamber in November, 1922, when the Air Service budget was under discussion. He said: "It cannot be denied that the aviation industry is passing through a crisis, but this is inevitable. A business lives by the orders it receives and, in aviation, orders have diminished and will doubtless continue to diminish still further, at any rate as regards airplane cells, when the orders for the war reserve have been filled."

Now, though orders are scarce, the number of factories has not diminished. On the contrary, manufacturers of all sorts, finding their own lines unprofitable, have turned into manufacturers of airplanes or airplane parts, so that they might secure a share

of the small appropriations the Air Service still had to spend. The result was that "in many instances these constructors were not able to complete the orders undertaken, because, in order to secure them, they had accepted prices which fell far short of covering their outlay. In other instances, airplane constructors by profession were compelled by this unfair competition to accept ridiculously low prices and often found themselves obliged to work at a loss and some of them have been nearly ruined." (From "L'Echo National," November 13, 1922.)

The whole of this passage might be written in the present tense, for it is still true. French aeronautic industry is withering, because it has too many branches and not enough sap. It must be pruned.

To quote further from M. Flandin's speech in Parliament: "I would recommend you" (turning to the Minister) "to restrict the number of airplane factories, so that larger orders might be placed. In this way, you could get a lower unit price."

M. Laurent Eynac replied: "It is certainly desirable for orders to be concentrated and given to firms having the requisite facilities and personnel." He added that it was a very delicate question and required careful handling, which fact no one doubts.

It is also certain that however severe the measure may be, however unjust in some particular cases, it is the only measure which can infuse new life into the aviation industry.

However large the amounts appropriated by Parliament for air-

plane construction, they will not be large enough to supply sufficient regular work for the multitude of factories still existing.

For this reason, the recent increase in the appropriations is not considered by anybody to be a cure for the crisis. It will be of some help, but will bring about no permanent revival in the airplane industry.

Here I would like to give the numerical details of the contracts entered into by the various governmental departments, but that is impossible.

I can at least mention the appropriations made in three years by the War Department alone. The amounts are:

164,888,500 francs for 1920,		
264,596,080	"	" 1921,
214,944,320	"	" 1922.

In reality, however, these figures have no great value, since from each annual total there must be deducted a considerable sum for contracts rightly belonging to the budget of the previous fiscal year and which were not completed in time to be delivered. As a matter of fact, by regulations applying to public accounts, certain orders placed during a fiscal year and not delivered by the 31st of the following January, are not counted for the fiscal year and the corresponding appropriation cannot be carried over automatically. The amount required must be again voted for the following fiscal year. Thus, the quoted figures do not give accurate information.

Let us rather recall the fact that, at the time of the armistice, the French Army Air Service had 3300 airplanes, that "breakage" (to use the military euphemism) was unfortunately very frequent and that, to meet the loss, the factories were turning out 100 airplanes per day.

At the present time, the total number of Army airplanes is 1217 and, after the present program is carried out, will still be under 2000. "Breakage" is not nearly so great as it was in 1918 and airplanes do not have to be replaced so frequently, in spite of assertions to the contrary. In the civil air service, the regular air lines have only 271 airplanes, while of privately owned airplanes there are yet very few. In 1922, French factories turned out a total of 3300 airplanes. As M. Laurent Eynac said in his speech of November 28, last, that may be something to be proud of, but it is certainly not enough to occupy profitably the excessive number of airplane factories still open.

Other figures will give us an idea of the great impoverishment of the French aviation industry. These refer to orders given by foreign governments. The following table, taken from "Documents statistiques sur le Commerce de la France," published periodically by the Customs Office, shows the exports of aviation materiel (aircraft and spare parts) since 1913. Note particularly the figures for the last three years, which show a very marked reduction. This table is appropriately supplemented by the table of imports.

Aviation Materiel

Exports.

Year	Weight		Value francs
	kg	lb	
1913	544,200	1,199,754	11,835,000
1914	489,200	1,078,500	10,201,000
1915	1,074,500	2,368,864	22,427,000
1916	3,061,800	6,750,106	67,432,000
1917	2,275,300	5,016,172	47,409,000
1918	1,747,600	3,852,794	36,180,000
1919	1,327,000	2,925,531	35,091,000
1920	1,723,100	3,798,781	45,594,000
1921	1,577,200	3,477,127	41,890,000
1922	732,500	1,614,884	20,627,000

Imports.

1913	-	-	-
1914	700	1,543	35,000
1915	-	-	-
1916	-	-	-
1917	24,600	54,234	1,870,000
1918	264,200	582,461	19,856,000
1919	29,100	64,154	2,779,000
1920	29,200	64,375	2,774,000
1921	12,300	27,117	809,000
1922	32,300	71,209	456,000

Markets open to French trade.- During 1922, several countries opened negotiations with French firms for the purchase of aviation materiel, or concluded contracts with them. These countries may become regular markets for the French aviation industry, if our aviation firms are well represented there and if the French Government will aid them in their dealings, instead of ignoring or hindering them, as it has sometimes done.

Spain.- The Spanish Government, wishing to place a large order for Army aircraft of all kinds, held, last March, an international contest of Army airplanes at Cuatro Vientos, near Madrid, under very severe technical conditions. Four French firms took part in it and seven firms of other countries. The tests were very exciting and the following commercial negotiations not less so. During these negotiations our manufacturers were greatly hampered by the stupidity of certain French newspapers which hailed the success of our aircraft as a victory of the Spanish Franco-ophile party over the Spanish Germanophiles. As a result of the contest, the Spanish Government ordered 20 Nieuports, type 29, (pursuit); 4 Farman-Goliaths (bombing); 30 Breguet 19 (observation); one Lorraine engine and some aircraft from other countries; two Swift torpedo planes; 4 Macchi seaplanes; 10 Rolls Royce engines and one Diesel engine.

This was an unquestionable success for French trade and also a lasting success, since the Spanish Government has purchased for future use, the manufacturing license for the aircraft chosen.

This market will be extremely advantageous for us. But we shall have to encounter much sharp competition and national feeling runs high. Therefore, the propaganda in favor of French business must be carried out with both energy and tact.

Poland.- Some years ago, at the suggestion of the French Government, an association of the manufacturers was formed for the purpose of exploiting the Roumanian and Polish markets. In Poland, especially, this association organized commercial representation, got into touch with the government and, when the latter was found to desire a Polish industry, even helped create an all Polish company, independent of French manufacturers.

Last year, however, when the Polish Government wished to enter into negotiations for ordering aircraft, applications were not made to this association, but direct to the various manufacturers.

This order was to be paid for out of money advanced to Poland by the French Parliament. The amount has been voted by the Chamber but the Senate has withheld its assent, in spite of the protestations of the Government.

If this order is placed, it will doubtless include about a hundred Potez airplanes, 50 Nieuport 29, 750 Lorraine engines, 30⁰ Hispano-Suiza engines and about a hundred Rhone engines; spare parts for Caudron, Breguet and Nieuport airplanes and Renault engines, and manufacturing licenses for Potez, Nieuport and Hanriot airplanes and Lorraine engines.

Roumania. - At one time in Roumania, manufacturers found themselves threatened with a strange competition, that of the French Government itself (wishing, no doubt, to prove that criticism of "a business State" was once more justified). This competition appears to have come to an end. Roumania is probably inclined to place orders in France, but nothing has yet been done in the matter and nothing definite can be announced.

In the northern countries of Europe the propaganda undertaken by our manufacturers has not always met with success. Sweden, after having shown some interest in one or two French airplanes, has gone back to German manufacturers. A Breguet airplane has, however, been purchased. Denmark has recently ordered 10 Potez airplanes.

Russia.- The Soviet Government, which is trying to reconstitute military aviation and organize civil aviation in Russia, approached German, Italian and French manufacturers at the same time. Negotiations have been entered into with the first two, but as may easily be imagined, the French hesitate somewhat. They have obtained the written authorization of the French Government to accept Russian orders. Negotiations have been going on for months and are not yet terminated for all the classes of airplanes. The order will no doubt comprise 47 Hanriot training airplanes, the same number of Gnome engines and, possibly some pursuit airplanes.

South America.- At the present time, the markets of Central America, and especially those of South America are particularly

important. The Santiago Disarmament Conference was practically a failure, and it is, therefore, certain that the Argentine Republic will place orders for Army equipment, while Brazil and Chili will be obliged to do the same. In Brazil, and especially in Argentina, there is a good deal of Italian competition, supported by the many Italians in the country.

In concluding this account of the French aviation industry, we may say that it has been in a very bad way for at least two years, owing to a general slump in business, the inevitable reduction in Army orders and the fact that the French government has no industrial policy. Only the energetic action of the government can save the situation. It cannot be too often repeated that the only solution of the question is for the government to select the best of the manufacturing firms and give them the full benefit of government orders.

Again, when French firms are negotiating with foreign powers, they should have the full support of their home government. The head of a French Mission should not be allowed to ignore them or to turn the cold shoulder. Above all, the government should not make the grotesque mistake of using its officials as business agents.

IV. Operation.

1. Air Lines.

Aerial Navigation - Difficulties of Development. - The aerial navigation companies are also having serious difficulties. These difficulties are not, either in character or cause, similar to those that threaten the manufacturing end of aviation, but their results can be no less fatal.

Commercial aerial navigation is a new enterprise, dating only from 1919, not yet sure as to its role, its possibilities, or the laws of its development, and still too weak to stand alone. Only one thing is certain, namely: that aerial navigation has an immense future before it and it is of general interest to help it along.

Good results have already been obtained and progress is constant. The following table gives the figures for the total traffic on French air lines beginning with 1919, and is followed by the results of the air mail service between France and Morocco.

Year	Covered km mi		Passengers carried	Mdse. kg lb		Mail kg lb	
1919	km	265,784	588	kg	6,966	kg	397
	mi	165,150		lb	15,357	lb	875
1920		853,959	1,379		48,100		3,925
		530,624			106,042		8,653
1921		3,353,455	9,427		166,490		9,481
		2,083,733			367,047		20,902
1922		3,543,291	14,397		529,664		41,173
		2,201,691			1,167,708		90,771

Air Mail between France and Morocco.

1920 (first half of year)	51,532 letters
1921 (" " " ")	101,202 "
1922 (" " " ")	474,110 "
1923 (" " " ")	1,231,875 "

In spite of this rapid growth, the position of aerial navigation is far from being assured. It has suffered from its own hesitancy, from public mistrust occasioned by accidents, and still more from the mistakes and shortcomings of the government. The main error, which, for at least a year, has had no excuse, is that the air lines are left to the mercy of a system so precarious that they cannot count on the future with any certainty, that they dare not and cannot commit themselves to any great expenditure for carrying out an extensive program or for renewing their material.

The System of Annual Subsidies.- With one exception, which we shall refer to later, all the air lines must apply to the government every year for the renewal of their grant, and they are never quite sure of getting it.

Even when granted, there is incredible delay in payment. The "Compagnie Franco-Roumaine" after being threatened with indefinite postponement, finally received its grant on May 17; the "Aéro navale," May 25, etc. In 1922, the "Compagnie Atlantique de Navigation Aérienne" only received its grant for 1922 on December 29. That is, the grant was paid at the end of the fiscal

year. Surely it would not be unreasonable to ask that these delays be reduced. The important point, however, is for the air lines to receive their grants for a longer period.

Long Contracts.- The air lines can claim the benefit of a law already passed, namely, Art. 103 of the Finance Law of July 31, 1920. This measure provides that "the government may bind itself to subsidize aerial navigation enterprises which are of public interest, but the contract shall not be binding for more than ten years." The air lines would be glad to get at least this ten-year contract. One air line, the "Compagnie Générale d'Enterprises Aéronautiques," obtained a five-year contract on July 11, 1919, that is, before the above-mentioned law was passed. This contract will soon expire. A few months later the "Compagnie Franco-Roumaine" obtained a "semi-official" promise of a similar contract (according to the Chairman of a Finance Committee). Recent events prove, however, that the company is right in insisting upon a more solid guaranty. The other companies are all on the annual-grant system. In a letter to the Finance Committee of the Senate, the government distinctly states that "no ten-year contract is yet in force, but it is anticipated that contracts of this kind will be made in 1923 with the Paris-Constantinople, Toulouse-Casablanca, and Paris-London lines. For the present, I have given up the project of subsidizing the Antibes-Tunis line for a term of years. This line is not yet in full working order, nor is it sufficiently developed to justify the granting of a ten-year contract."

Without going into the question of whether this latter restriction is justified and whether the fact of authorizing a line and subsidizing it year by year does not imply that it is of "public interest" and worthy of continued support, we may at least hold to the formal promises of the government and hope that they will be fulfilled with greater promptitude than the law of 1920.

Necessary Reform of the Bonus System.- We must provide something better than ten-year contracts with the present bonus system. There must be a complete remodelling of the whole system under which the air lines are operating. A few points were modified by the decree of April 14 last, but the general plan remains the same. Government aid is given in the form of grants for the purchase of airplanes and engines (equal to half the invoice price); pro rata grants for the number of kilometers covered, varying accordingly to the amount of useful tonnage; special grants for speed and comfort; commercial-efficiency grants for passengers and freight carried; lastly, grants for radio equipment.

A member of Parliament called this system the "narcotic of aviation." M. Raoul Anglès stated that "it encourages the companies to be idle," that "the grant per kilometer is a grant for inertia," that it allows the companies not only to do without passengers, but even leads them to prefer having none, etc. We will not here re-open an interminable argument, but will only say (with M. Henri Bouche, who in "L'Aéronautique" for December,

1922, defined both the defect of the present system and the principle of the reform to be accomplished) that "Enterprises must be placed more firmly on their true economic basis. This can be done by taking the grants, which are now chiefly made for kilometers covered, and applying them as the rewards of technical effort and commercial efficiency. This is possible, however, only after the establishment of guaranties for a long period.

Bill for a New and Stable System.- Such guaranties are contained in a general legislative bill, drawn up nearly two years ago and modified several times. This bill would have been passed before now, if the Ministry of Finance had not opposed it and if the Council of State, which has had it under consideration for some time, had not gone to sleep over it. This bill does not entirely do away with the bonus system, but greatly simplifies it. It institutes a system of long contracts with a common guaranty fund, similar to that instituted by the Act of October 29, 1921, for railroads, and provides for government participation in possible profits.

What should be the length of these contracts? It seemed that 30 years should be the minimum, but the Ministry of Finance was not willing to exceed 10 years provided by the Finance Act of 1920. A 10-year term is too short, since no capitalist would risk a large sum of money in so brief an enterprise. Notwithstanding its imperfections, let us hope this bill will be passed with all speed. Any system offering even slight stability is better than the present precarious state of affairs.

The British System.- As a matter of comparison, it is interesting to consider the statutes recently enacted by the British and Belgian Governments with regard to their air lines.

In England, the bill of the "Hambling Committee provides for the formation of a single new company with a capital of one million pounds sterling, the government to grant a subsidy of like amount, distributed over a term of ten years. The profits of the company will first be applied to the payment of a dividend of 10% to the shareholders, the remainder being divided between the shareholders and the government. When the dividends paid to the government equal the amount of the subsidy, the company will become entirely free and autonomous. The committee insists that government aid and control must be essentially temporary in their character and states that, in principle, "it does not advise the formation of a company under the control of the government, but, on the contrary, it recommends a commercial organization operated on commercial lines." The aid of the government is accepted only as a temporary necessity. This company is to be ready to begin operations by April 1, 1924.

The Belgian System.- Unlike the British project, the Belgian bill gives the government a preponderant and permanent role. A company has been formed for a period of thirty years. The government's share in it is so large that a government majority is assured in all the General Assemblies. The management is in the hands of a private committee but 4 out of the 12 members are appointed by the government and have the power of veto. The gov-

ernment is to advance sums equal to the deficits which may result from the operations of the company, but will later receive a large part of the profits. "If there are any profits, the company shall first pay a recoverable interest of 6% on its preferred stock" (of which the government holds half) and a contingent extra dividend of 2%. Any further profits shall be paid to the government, up to the amount of the sums advanced."

"This participation gives the government financial control, where it would otherwise have had only administrative control. Although the government has a minority of directors, any one of this minority can veto any measure deemed to be contrary to the interests of the State." (From "Conquete de l'Air.") This is a manifestation of state control, which we consider both bold and imprudent. (Belgian railroads are already operated directly by the government.)

French Air Lines.- We have neither the wish nor the space to give a complete table of the world's air lines, but will confine ourselves to those of France.

"Compagnie générale d'Enterprises Aéronautiques."- This company is often referred to as "the Latécoere Company" from the name of its former owner and present chief, M. P. Latécoere. Since 1919, this company operates under a five-year renewable contract.

Toulouse-Casablanca line, via Barcelona, Alicante, Malaga and Rabat (1845 km - 1146.43 mi). This line is to be extended to Dakar, passing through Agadir, Cape Juby, Cape Leven, Port

Etienne and Tivourvourt. It may be extended later to Buenos Aires by a trans-oceanic line. Since October, 1922, it also operates the line Casablanca-Oran, via Rabat and Fez (755 km - 469.13 mi). This is the first portion of the Casablanca-Tunis line, via Algiers, which is to be opened shortly. On these lines Breguet and Latécoere limousines are used.

The company has also reserved the right to exploitation of the Marseilles-Algiers line via Barcelona and the Balearic Islands (900 km - 559.23 mi) to be operated by seaplanes and airplanes. This line has already received a subsidy of 700,000 francs from the "Délégations Financières" of Algeria. The first part of the line, Marseilles-Perpignan, in correspondence with the Toulouse-Casablanca line, was opened July 15. Another section between Barcelona and Palma (on the island of Majorca) was already being operated by a Spanish company. The Latécoere Company bought it, but as the Spanish Government immediately stopped the subsidy, traffic has been suspended for the present. When the whole line is opened there will be a through air service between France and Algeria. This has long been contemplated, but the technical difficulties have hitherto seemed too great.

There is to be a small line between Alicante and Oran, paralleling in some sort the last section of the France-Algeria line. The "Délégations Financières" have granted this line a subsidy of 700,000 francs. It is to be opened August 1.

The Latécoere Company also intends opening a line from Bordeaux to Lisbon, via Madrid.

The results of the operation of the Toulouse-Casablanca line for the first half of 1923, are here tabulated:

Month	Passengers		Mdse.		Mail	
		kg	lb	kg	lb	
January	80	4351	9,592	5062	11,160	
February	86	3666	8,082	4610	10,163	
March	89	4030	8,885	4961	10,937	
April	85	472	1,041	4348	9,586	
May	102	4759	10,492	4543	10,016	
June	104	4600	10,141	4999	11,021	

The freight consists largely of mail and the table at the beginning of this chapter shows its rapid increase on this line. From an economic point of view, this is very interesting and encouraging, because postal matter forms the most reliable and regular part of the load. The development of this part of the traffic precedes and automatically determines the progress in the amount of freight and the number of passengers carried. Letters are first sent by the air, then freight, and finally people venture to risk themselves. This fact may be recalled in connection with the Paris-London line, but it is nowhere more pronounced than on the Moroccan line.

Compagnie Franco-Roumaine de Navigation Aérienne.- This line was founded in 1920. Most of the capital was supplied by M. Aristide Blank, a Roumanian financier. The company operates the Paris-Constantinople line, via Strasburg, Prague, Vienna, Budapest,

Belgrade and Bucharest, a distance of 2742 km (1703.8 mi) and the Prague-Warsaw line (530 km. - 329.3 mi), a branch of the Paris-Constantinople line. The last section of the Paris-Constantinople line, from Bucharest to Constantinople, does not yet function regularly, due to certain difficulties of a diplomatic nature.

Its annual subsidy, renewed May 17, provides that the service be performed by the airplanes: Spad-33, Spad-46, Salmson limousines, Potez-7 and Potez-9. It also contains a clause peculiar to this company, stipulating that the shares, which are all registered, can only be transferred to persons approved by the French Government or, for a quarter of the shares, to persons belonging to nations represented in the League of Nations. This clause is intended to calm fears which were expressed concerning the nationality of the country's capital. The lines it operates are of great political interest and since they are subsidized by the French Government, it seems only fair to stipulate that the capital shall remain in French hands.

The Under-Secretary of State has solved the question very nicely, as regards the incontestable rights of the present principal shareholder, of whose friendship for France there has never been any doubt, while at the same time, guarding against the transfer of stock to less reliable hands.

The results of the operation of the Franco-Roumanian Company's lines for 1923, are given below:

1. Paris-Constantinople.

Month	Passengers	Mdse.		Mail	
		kg	lb	kg	lb
*January	-	-	-	-	-
February	17	1245	2,745	7	15.43
March	123	11312	24,939	119	262.35
April	210	15185	33,477	321	707.68
May	273	18444	40,662	429	945.78
June	294	18190	40,102	457	1,007.51

2. Prague-Warsaw.

*January	-	-	-	-	-
*February	-	-	-	-	-
March	12	608	1,340	60	132.28
April	33	1438	3,170	69	152.12
May	30	3074	6,777	119	262.35
June	25	2742	6,045	116	255.74

It should be noted that many difficulties have arisen during the last three months on the Strasburg-Prague section. The Germans, taking as a pretext a decision of the Conference of Ambassadors of April 14, 1922, forbidding them to build or use airplanes other than those specifically and exclusively commercial, claim, in turn, the right to prohibit the flight over German territory
 *Traffic suspended in winter.

of airplanes belonging to the Franco-Roumanian company, because these airplanes have military characteristics. Up to June 24, ten airplanes which had made forced landing in German territory were seized and the pilots threatened with imprisonment. This state of things cannot continue, since Art. 200 of the Treaty of Versailles specifically provides that Germany shall allow the free passage of Army airplanes belonging to the Allies. The company still continues to function, however.

The Air Union.- Since 1920, two separate companies have been working the Paris-London line. Both are subsidized by the government and are competing with each other at the government's expense. At one time in 1920, a third French company was also working this same line. This was a curious state of things, which the Under-Secretariat has recently remedied. From January 1, 1923, the "Compagnie des Messageries Aeriennes" and the "Grands Express Aériens" have been merged into one company, called "L'Air Union."

This new company received its subsidy for 1923, on April 28. It operates two lines:

Paris-London (375 km -233 mi)
Paris-Brussels (275 km. 170.9 mi)

The airplanes in use on these lines are: Farman-60 (Goliath); Breguet -14T and 14-T bis; Spad 27, 33 and 50; Salmson A.2.

In 1922, the "Messageries Aeriennes" had undertaken the working of the Paris-Marseilles line (second section of the great "Indian Mail Line" - London, India, Australia via the Mediterranean

basin), but in the 1923 budget the appropriations were reduced and the "Service de la Navigation Aérienne" was obliged to economize and this line was suppressed. This was probably an error and one of these days the line will have to be reopened, for it is on one of the main highways of the world. But by that time England will have her "India Mail Line" across Germany and the Balkans. People will have grown accustomed to use it and our line will no longer be necessary. For lack of foresight, we have thus made the most costly economy.

The "Messageries Aériennes" also operated an extension of the Paris-Brussels line to Amsterdam. It has been discontinued this year by agreement with a Dutch company.

The Paris-Havre line, connecting with the boat service, did not seem to be of public utility and the government subsidy was not continued in 1923. The Air Union and the "Compagnie Générale Transatlantique" have not, however, definitely abandoned this enterprise.

The Paris-Lausanne line, operated by the "Grands Express," has also been deprived of its subsidy and has disappeared. As a matter of fact, it unnecessarily duplicated the Paris-Marseilles line.

Negotiations with a German company for an air line from Paris to Berlin via Frankfort, which were begun in 1921, have been suspended for various reasons.

Traffic of the Air Union Company in 1923.

1. Paris-London.

Month	Passengers	Mdse.		Mail		
		kg	lb	kg	lb	
January	74	26763	59,002	56	123.46	(66 trips)
February	64	23460	51,720	33	72.75	(45 trips)
March	314	52206	115,094	108	238.10	(111 trips)
April	355	44855	98,888	104	229.28	(116 trips)
May	206	56188	123,873	90	198.42	(109 trips)
June	165	43955	96,904	67	147.71	(93 trips)

2. Paris-Brussels.

January	44	3378	7,447	46	101.41	(43 trips)
February	19	1702	3,752	18	39.68	(19 trips)
March	122	7834	17,271	56	123.46	(56 trips)
April	189	8384	18,484	53	116.84	(56 trips)
May	211	9310	20,525	117	257.94	(59 trips)
June	137	8369	18,450	77	169.76	(54 trips)

Comparing the first of these tables with the table published by the British company operating the same line, we find that the British line carried a greater number of passengers. During the first four months of 1923 the French line made 338 trips and carried 807 passengers (an average of 2.4 per trip), while the British line made 178 trips and carried 1191 passengers (an average of 6.6 per trip).

This difference arises mainly from the fact that air transportation is more used by the English than by the French. For last January, English travelers formed 50% of the total traffic between Paris and London; Americans, 22% and French only 10%. Whether from a feeling of patriotism or simply for convenience, people go to the company where their own language is spoken.

"Compagnie Aero Navale." This company was formed in October, 1921. Its annual subsidy was renewed May 25. It is to operate a line from Antibes to Tunis, via Ajaccio and Carioforte, a distance of 901 km (559.9 mi). Donnet-Denhaut and Liore-Olivier seaplanes are to be used. At present, only the first section, between Antibes and Ajaccio, is in operation.

The Tunis line is intended to form the third connecting link between France and North Africa, the Morocco and Algeria lines being operated by the Latécoère Company.

For the first half of 1923, the results were as follows:

Month	Passengers	Mdse.		Mail kg	
		kg.	lb		
January	19	69	152.12		(9 trips)
February	"	"	"	-	(")
March	"	"	"	-	(")
April	33	8	17.64	-	(20 ")
May	42	82	180.77	-	(31 ")
June	4	117	257.94	-	(22 ")

Research Societies.- Besides the above mentioned companies which are actually operating certain air lines, we must refer to other companies which, though legally formed, have not yet undertaken commercial operations. The most interesting and most important of these undertakings is the "Néréide," a research organization interested especially in the improvement of the Mediterranean lines. The maritime navigation companies are actively interested in the "Néréide."

Dead Companies.- We must also mention two companies which were dissolved in 1922, namely, the "Aero-Transports du Midi et du Sud-Ouest," operating a line from Bordeaux to Montpellier, and the "Compagnie Franco-Bilbaine" which operated a line from Bayonne to Santander via Bilbao. General Hirschauer, Chairman of the Aeronautic Finance Committee in the Senate, said that the former line was "of local importance" and the latter "of no importance." We may also apply to them (and more especially to the second) the utterances of M. de Jouvenel and M. Laurent-Eynac in the Senate concerning the "aerial coasting trade" and its lack of utility. If an undertaking is worthy of it, that is, the lines must follow a great commercial highway, must connect important commercial centers and must be of sufficient length to ensure a great saving of time as compared with rail transportation. Only thus can the lines be assured of sufficient freight to warrant their existence as a commercial asset. In exceptional cases, state aid may be given to a line of no commercial impor-

tance, provided it be of great political importance. The two lines in question were of no political and very little commercial importance.

Colonial Companies.— There are other lines, still existing to which this double test might well be applied. We mean certain colonial lines. The question of these lines has often cropped up during discussions on the budget, chiefly because MM. Tisseyre and Morinaud have generously appealed to Parliament in their behalf.

It is evident that the airplane is called upon to play an important role in the colonies. In the absence of railroads, navigable rivers and passable highways, airplanes ensure rapid communication between the most distant points of the territory.

Still, it must be questioned as to whether there is sufficient reason, political or commercial, for establishing a regular commercial service by a state-aided private company.*

The "Compagnie Générale des Transports aériens Guyanais" has undertaken to operate two lines from Saint Laurent du Maroni to Cayenne and Inini. The "Compagnie Atlantique de Navigation aérienne" operates a line in Senegal from Dakar to Kayes. This

* Here we may recall what M. Fonck said in the Chamber on the possibility of utilizing colonial Army aviation for the mail service. "The work done by the Army aviation, whether in Algeria, Morocco, or in the Senegal, is not at all what it should be. It is not advantageous to have Army aviators merely flying over the country, while neither the air mail service nor connection between outlying posts is assured."

It should also be noted that in the Levant the mail service is operated regularly by the French Army Air Service.

line is to be extended to Timbuctoo. The "Société du Réseau aérien Transafricain" operates the Algiers-Biskra-Touggourt line which is to be extended to Timbuctoo where it will join the Dakar-Kayes line and also the line from Tuléar to Antsirabe in Madagascar.

The first of these companies stopped operations in 1922. The other two have not been received with much enthusiasm at the Under-Secretariat of State and, though it is not quite true, as asserted by M. Tisseyre in the second sitting of the Chamber on June 28, 1923, that the government tried to stab them in the back, it is certain that only small subsidies were granted to the Algiers-Biskra line, dubbed "experimental" and "seasonal," and to other lines classed as experimental lines. Also, the colonies were requested to help, out of their own funds, in keeping up their own lines.

In these cases, hesitation was justified. Hostility to the principle of colonial air lines would be unjust, but we are persuaded that the rules we ask to have applied to air lines in France, should be applied also to colonial lines and we are sorry that M. Laurent-Eynac, in his last address to the Chamber, did not lay down the principle that before colonial lines are subsidized by the government they must first meet the commercial or political conditions required of every air line. If a colony makes the mistake of subsidizing a line which does not answer these conditions, that is no reason why the government should fall into the same error.

For the Dakar-Kayes line, we ask, with General Hirschauer, "whether its creation is justified by the amount of traffic between Dakar and Kayes." We would like to ask the same question with

regard to the Algiers-Biskra-Touggourt line, but the latter will probably be of political interest, when a French "Empire Line" is organized, connecting France with her colonies and passing through Algiers and the Sahara.*

For the first half of 1923, the results obtained are:

1st. Algiers-Biskra.

Month	Passengers	Mdse.		Mail		
		kg	lb.	kg.	lb.	
January	20	21	46.30	0.5	1.10	(15 trips)
February	7	16	35.27	0.1	0.22	(6 trips)
March	17	11	24.25	0.1	0.22	(15 trips)
April	23	39	85.98	0.2	0.44	(20 trips)
May	27	25	55.12	0.5	1.10	(22 trips)
June	2	"	"	"	"	(2 trips)

Biskra-Touggourt.

Month	Passengers	Mdse.		Mail		
		kg	lb.	kg.	lb.	
January	2	4	8.82	-	-	
February	12	15	33.07			
March	12	12	26.46	-	-	
April	4	8	17.64	4	8.82	
May	2	2	4.41	4	8.82	
June	2	"	"	"	"	

* As we go to press, we learn of the formation of a "Compagnie Générale Transsaharienne" for the purpose of promoting land and air communications between Algeria and the Niger river.

2nd. Dakar-Kayes.*

September, October, November, 1922 : Nothing.

December, 1922	8	44
January, 1923	"	"
February	"	"
March	1	"
April	"	"
May	"	"
June	"	"

2. Aerial Business Companies.

Compagnie Aérienne Française.- Though the regular air lines are much talked about, both by the public and the press, companies which use airplanes for other purposes than the regular transportation of passengers and freight are not so well known. By far the most important of these is the "Compagnie aérienne française" which receives an annual subsidy** from the government in the shape of various bonuses and which undertakes all sorts of aerial business, including:

1. Letting out airplanes on hire, pleasure rides and round trips;
2. Aerial advertising by searchlights, luminous posters, smoke letters, etc.;

* All our tables are due to the courtesy of the "Comité Français de Propagande Aeronautique."

** The subsidy is, however, very small as compared with the amount of business done. This company has adopted an excellent principle, namely, to make the client pay, rather than the state. It is, of course, much easier for this company to do so, than for the transportation companies.

3. Aerial photographs of works in course of execution, buildings, estates, towns, geographical curiosities, etc.
4. Lastly, what seems to be of great importance, remaking the official survey of the country with the aid of aerial photography.

The last official survey, made at the beginning of the nineteenth century, is no longer accurate. The division of property has been changed, even rivers and roads have been modified and there are new roads and railroads, not indicated on the map. No less than 77 departments have expressed the wish to have this work done.

By ordinary topographical methods, the work would take 25 years and would cost two billion francs. With aerial photography we are told it would cost only 900 millions and could be done in 10 years.

A survey carried out on modern lines would, moreover, be much superior to a mere topographical survey. From experiments made in 1922, in a township in the department of the Oise, it was proved that the average error in a surveyor's plan was 0.81 m (2.657 ft) while in a plan made by aerial photography it is only 0.41 m (1.345 ft) on a scale of 1/2000.

Some members of Parliament took up this question and M. Louis Morin even presented a bill for remaking the official survey by aerial photography, but it is not known what became of the bill.

It is certain that "aerial work" of this kind is quite as worthy of the attention of public officials and of the general public as the regular air transportation services.

Before terminating this part of our account of aerial activities, we would recall a remark previously made and also express a wish. Aerial navigation companies are not able to work in a normal, tranquil manner, because the government's policy toward them is neither definite nor settled. If, from now on, they knew what they had to count upon and in what direction their efforts should tend, if they had a guaranty of a stable system, if the government would advisedly give its moral support and its subsidies only to companies and lines which are really of importance and likely to prosper, French aerial navigation would be assured of great development and strength.

As in aeronautical construction, there must also be restrictions here. Air lines should not be subsidized indiscriminately, nor should small companies be allowed to sprout haphazard. On this subject M. Laurent Eynac has made a formal promise to the Senate which we are happy to quote here:

"..... I agree with M. de Jouvenel in what he says concerning the policy of large systems. As a matter of fact, we are addressing ourselves resolutely to this policy. In the early days of air transportation, we could allow the formation of small companies operating short lines, but we now desire to consolidate the whole activity of French air traffic into four or five large organizations. This policy will be more economical for the government and also more dependable, since it will give us strong, well-equipped companies, assured as to the future and able to work out far-reaching programs."

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National Advisory Committee for Aeronautics.